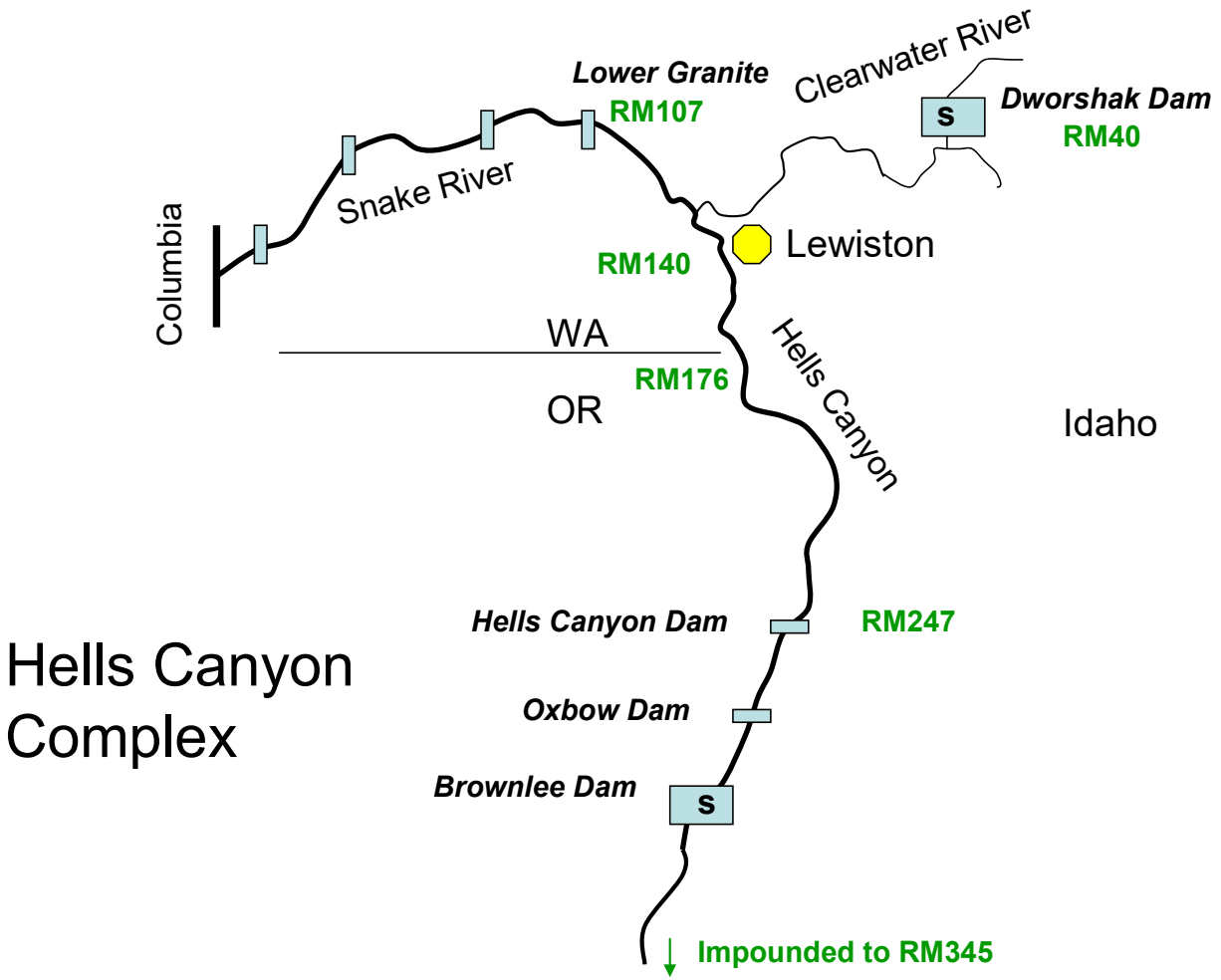
EPA's Upcoming CWA Action on Idaho's Site Specific Criterion for Temperature for the Snake River

February 28, 2019

Hells Canyon Complex



Hells Canyon Complex

Basis of the 13C SSC

- IDEQ cited to the salmonid spawning criterion from EPA's Pacific Northwest Temperature Guidance (2003)*
- Oregon and Idaho currently both have 13 SSC
- Guidance looked at lethal and sublethal impacts of temperature on eggs and fry
- Guidance looked at broad array of literature – many river systems, salmonid species, and thermal regimes
  - Continuous temperature experiments and declining temperature experiments. 13C 7dadm recommended as upper end of optimal range.
    - 13C max from constant experiments on egg viability, but identified 14C as upper end of daily average range at which spawning most frequently occurs
  - Published prior to Geist et al. 2006 study

*Available at: https://www.epa.gov/wa/northwest-water-quality-temperature-guidance-salmon-steelhead-and-bull-trout

Background

- On June 8, 2012, Idaho submitted a revised site specific criterion for the Snake river to EPA. EPA must take action to approve or disapprove the SSC.

  –We have not taken action on the SSC pursuant to CWA Section 303(c) and implementing regulations at 40 CFR Section 131.21.

- Below is the revised language:

SNAKE RIVER, SUBSECTION 130.01, HUC 17060101, UNIT S1, S2, AND S3; SITE SPECIFIC CRITERIA FOR WATER TEMPERATURE. *~~A maximum weekly maximum temperature of thirteen degrees C (13C) to protect fall chinook spawning and incubation applies from October 23rd through April 15th in the Snake River from Hell's Canyon Dam to the Salmon River.~~ Weekly maximum temperatures (WMT) are regulated to protect fall chinook spawning and incubation in the Snake River from Hell's Canyon Dam to the confluence with the Salmon River from October 23 through April 15. Because the WMT is a lagged seven (7) day average, the first WMT is not applicable until the seventh day of this time period, or October 29. A WMT is calculated for each day after October 29 based upon the daily maximum temperature for that day and the prior six (6) days. From October 29 through November 6, the WMT must not exceed fourteen point five degrees C (14.5°C). From November 7 through April 15, the WMT must not exceed thirteen degrees C (13°C).*

What is different in revised SSC?

- The weekly maximum temperature from October 29 to November 6th would be 14.5C
  - (November 7th-April 15th still 13C)
- October 23rd to October 29th, is stated to be the first averaging period for the lagged 7-day average daily maximum, such that 14.5C is not "applicable" until October 29th
- Slight change from a "maximum of the weekly maximum temperatures" to a "weekly maximum temperature"

Scientific Basis: What information does IDEQ cite to support the revised SSC?

- **Four lines of evidence from laboratory and field observations**
  - "Laboratory studies of temperature on Chinook egg incubation show no sign of effect on incubation success for eggs exposed to the proposed criterion temperatures"
  - "Fall Chinook initiate spawning at temperatures even warmer than the proposed criterion"
  - "Under the current thermal regime…fall Chinook spawning has been improving"
  - "The ramp in temperature the revised site-specific criterion allows for closely mimics the typical fall decline in water temperatures as seasons change"

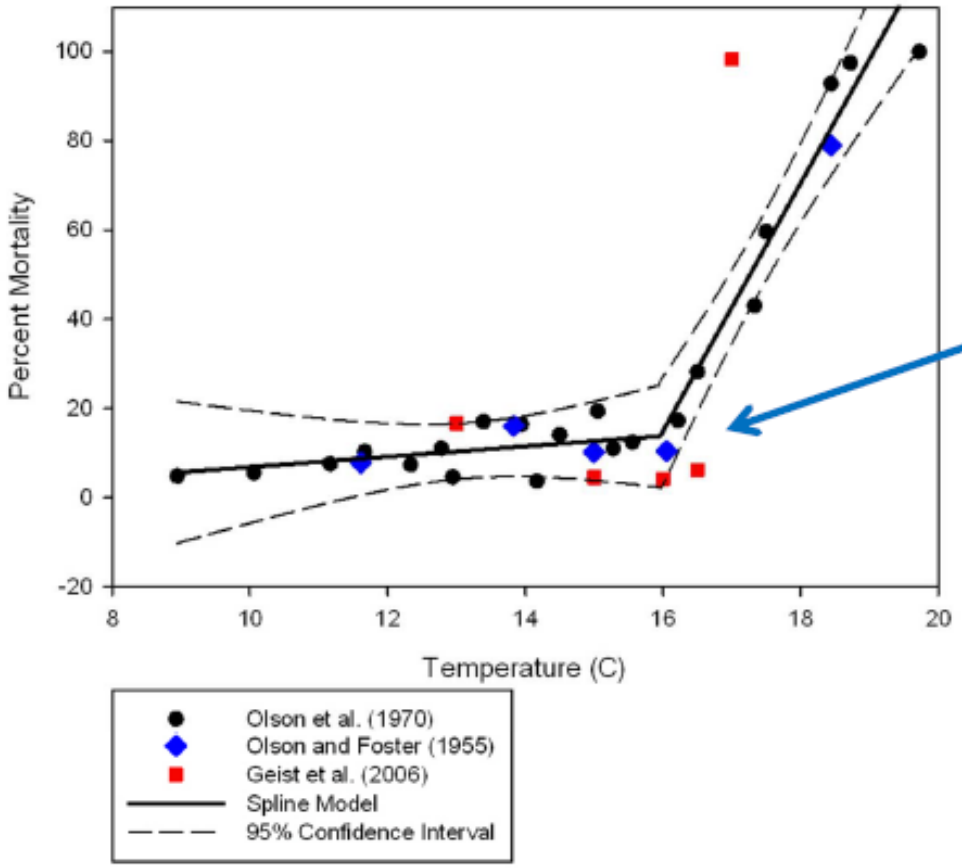
Scientific Basis: 3 Studies provided as evidence

- "Three specific studies to fall Chinook salmon initial incubation temperatures":
  - Geist et al. (2006) – SR fall Chinook salmon
  - Olson et al. (1970) – Hanford Reach fall Chinook salmon
  - Olson and Foster (1955) – Hanford Reach fall Chinook salmon
- "All three studies indicated a sharp increase in mortality when a threshold temperature during incubation was exceeded."
  - Geist et al. (2006) reported a temperature threshold value of 16.5°C
  - Olson and Foster (1955) study reported a value of 16.1°C
  - Olson et al. (1970) did not report a threshold value, but yielded a temperature threshold for mortality similar to that found in the Olson and Foster (1955) report.

All information from the final IPC presentation to the IDEQ Board of Environmental Quality, November 10th, 2011

IDEQ/IPC cited laboratory data

Supporting Science



- **Segmented regression – a spline model.**
  "join point" – indicates threshold temperature at which mortality begins to increase.
- **threshold value – 16°C**
- **95% confidence interval ranging from initial daily maximum of 15.3°C to 16.6°C.**
- **An initial daily maximum of 15.3°C under a 0.2 °C daily rate of decline is equal to a Weekly Maximum Temperature (WMT) of 14.7 °C.**

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Scientific Basis and Level of Protection: NOAA's Fall Chinook Recovery Plan (November 2017), Temperature Impacts and Summary

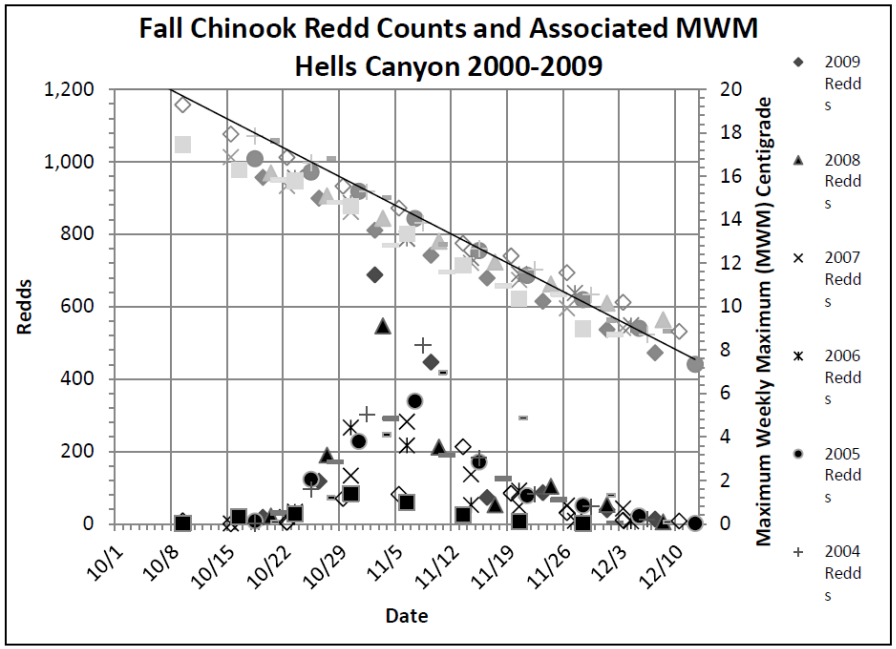

Figure 5-3. Snake River fall Chinook salmon ESU redd counts in Hells Canyon in relation to maximum weekly maximum water temperatures.

	Date	Daily estimates of cumulative (%) redd counts			Mean daily temperature
Interval start date ==>	10/13/2014	2.6% / (13+1)	=	0.2%	17.0
	10/14/2014	2.6% / (13+1) + 0.2%	=	0.4%	16.6
	10/15/2014	2.6% / (13+1) + 0.4%	=	0.6%	16.2
	10/16/2014	2.6% / (13+1) + 0.6%	=	0.7%	15.8
	10/17/2014	2.6% / (13+1) + 0.7%	=	0.9%	15.6
	10/18/2014	2.6% / (13+1) + 0.9%	=	1.1%	15.7
	10/19/2014	2.6% / (13+1) + 1.1%	=	1.3%	15.7
	10/20/2014	2.6% / (13+1) + 1.3%	=	1.5%	15.6
	10/21/2014	2.6% / (13+1) + 1.5%	=	1.7%	15.4
	10/22/2014	2.6% / (13+1) + 1.7%	=	1.9%	15.2
	10/23/2014	2.6% / (13+1) + 1.9%	=	2.0%	15.0
	10/24/2014	2.6% / (13+1) + 2.0%	=	2.2%	14.6
	10/25/2014	2.6% / (13+1) + 2.2%	=	2.4%	14.5
Interval end date ==>	10/26/2014	From (Table 1)		2.6%	14.1

Level of Protection: NOAA's Fall Chinook Recovery Plan (November 2017), Temperature Impacts and Summary

- "Currently, roughly 10 to 20 percent of redds are deposited between October 23 and 31, when water temperatures are 14.5 to 16 °C (58 to 61 °F) and within a range where there is still uncertainty regarding whether impacts to egg and fry viability are occurring, and if so, to what degree."

- "…most spawning (about 96 percent of redds counted) in the Upper Hells Canyon reach of the Lower Snake River typically does not occur until temperatures fall below 16.5 °C (61.7 °F) (Groves and Chandler 1999; Groves et al. 2013; Appendix C). Lesser impacts could be occurring to eggs deposited in late October when temperatures are usually 14.5 to 16 °C (58 to 61 °F); there is, however, substantial uncertainty in the literature because very few studies have attempted to measure egg and fry mortality from elevated spawning temperatures in a declining temperature regime."

NOAA's Fall Chinook Recovery Plan (November 2017), Temperature Summary

Summary: "While the temperatures are not always optimum, and while some Upper Hells Canyon reach spawners may be negatively affected, existing studies specific to Snake River fall Chinook salmon do not point to temperature as a significant limiting factor. Recent high abundance of naturally produced Snake River fall Chinook salmon spawning in the area also suggests that this is not currently one of the more significant limiting factors for the ESU."

Downstream Protection

- Oregon's criterion is 13C as a 7dadm for this time period and extends to the border of ID/OR/WA
- The most sensitive use designated DS in OR waters is the same for this time of year- salmon spawning
- ID will have to implement CWA programs to protect downstream waters

Next steps

- 4/5/19 – Interim date to either take action on the criterion or send a Biological Evaluation to NMFS and FWS to initiate consultation under the Endangered Species Act.
  - ESA consultation would allow the Services to opine on the protectiveness of 14.5C
  - Services have 135 days to produce an Opinion
- We will continue communication and keep the Tribe apprised about this action

Contact info

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